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Programm zur grenzüberschreitenden Zusammenarbeit SLOWAKEI - ÖSTERREICH 2007-2013
Program cezhraničnej spolupráce SLOVENSKÁ REPUBLIKA - RAKÚSKO 2007-2013

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Soils as an indicator of flood protection – a cross border case study in the Moravian plains

Cooperation

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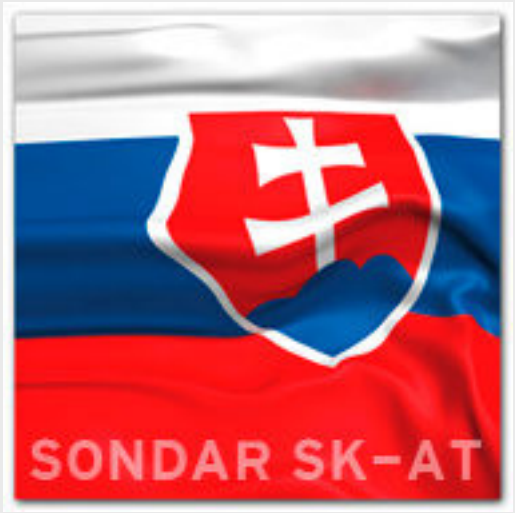
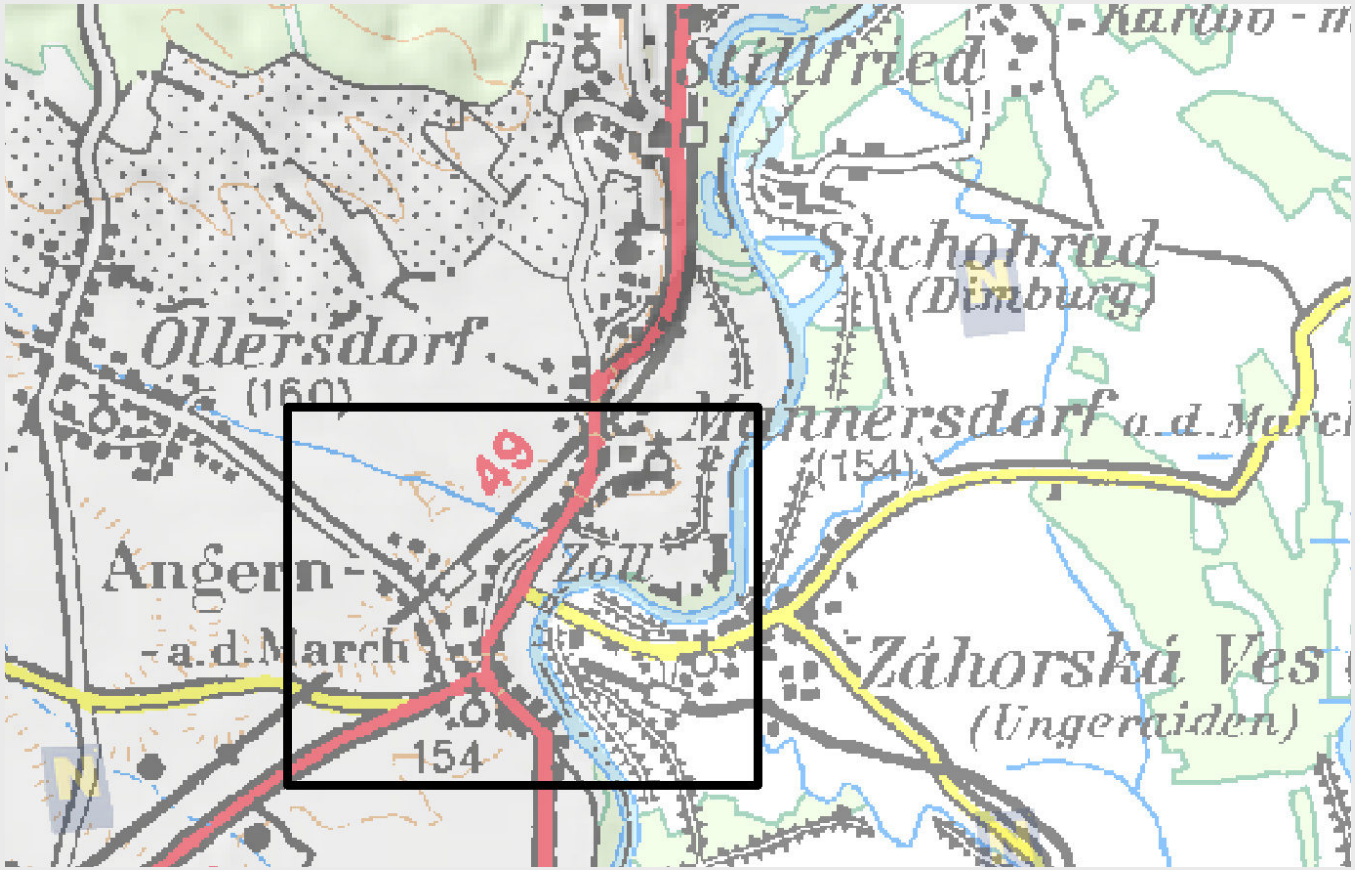
Soil Strategy Network in the Danube Region



Study area

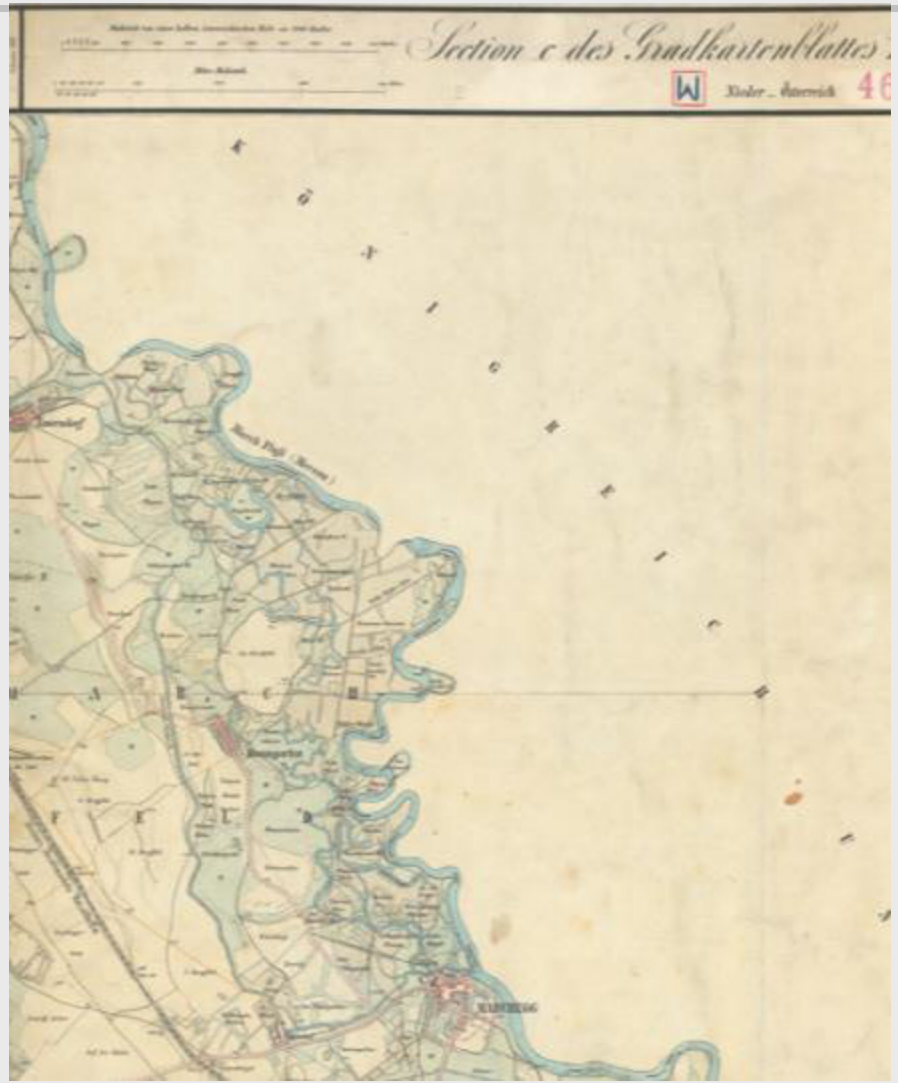
As a common study area the municipalities of Angern an der March in Austria and Záhorská Ves in Slovakia were selected.



Land Niederösterreich

Morava River

The Morava river is one of the largest tributaries flowing into the Danube River.
It is a lowland river with about 0,18% slope.



Course of the non-regulated March in the area Marchegg –Zwerndorf; Archiv des Militärgeografischen Institutes

Morava River

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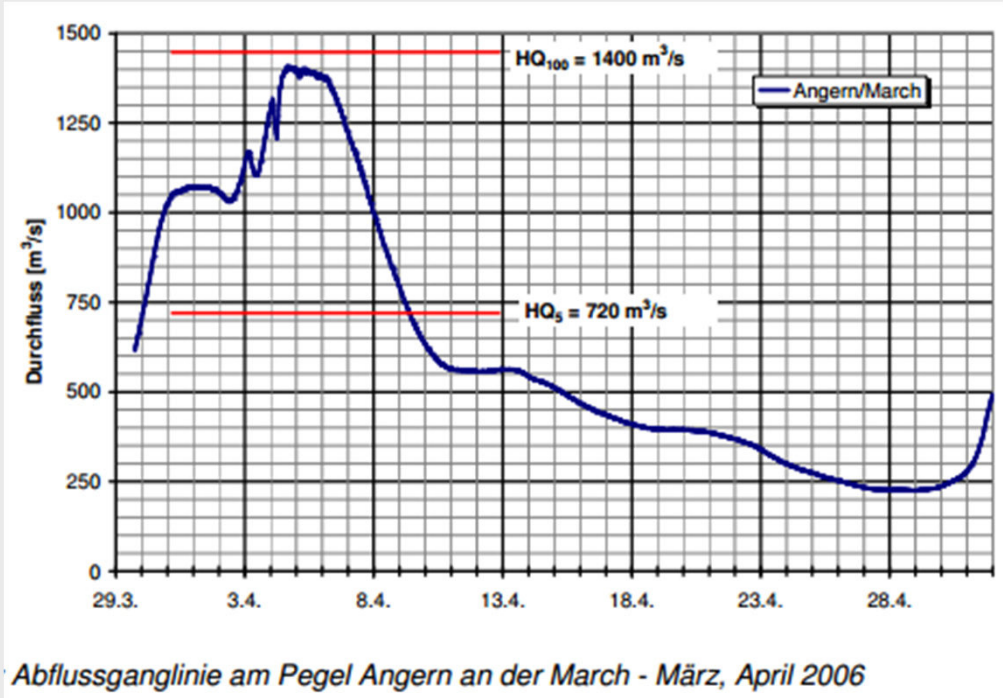
Discharges reach a maximum in March and April because of the melting mountain snow and in the summer months discharges are conditioned by heavy rainfalls



Abflussganglinie am Pegel Angern an der March - März, April 2006

Hydrograph at gauging station Angern an der March; Lebensministerium

Floods in Angern an der March and Záhorská Ves, SK, on 31/3/2006 ; Municipal Office Angern an der March

Soil as an indicator

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Can we read off from soils where floods occur?

Gerlinde Ortner

Soil as an indicator

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Auboden (Fluvisol)

Soil features caused by flooding by rivers

• Repeated flooding leads to a sequence of
typical layers in the soil profile

Müller und Hoffmann, NLfB

Soil as an indicator

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Gley (Gley soil)

Soil features caused by flooding by groundwater

- In this Gley soil groundwater is usually up to 80 cm below the ground surface and therefore causing the typical colours

Soil-net.com

Soil as an indicator

Feuchtschwarzerde (Gleyic Phaeozem)

Soil features caused by flooding by groundwater

- Due to the temporary high water saturation this soil shows a 70 cm thick humic layer.

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Austrian soil map eBOD 1:25.000

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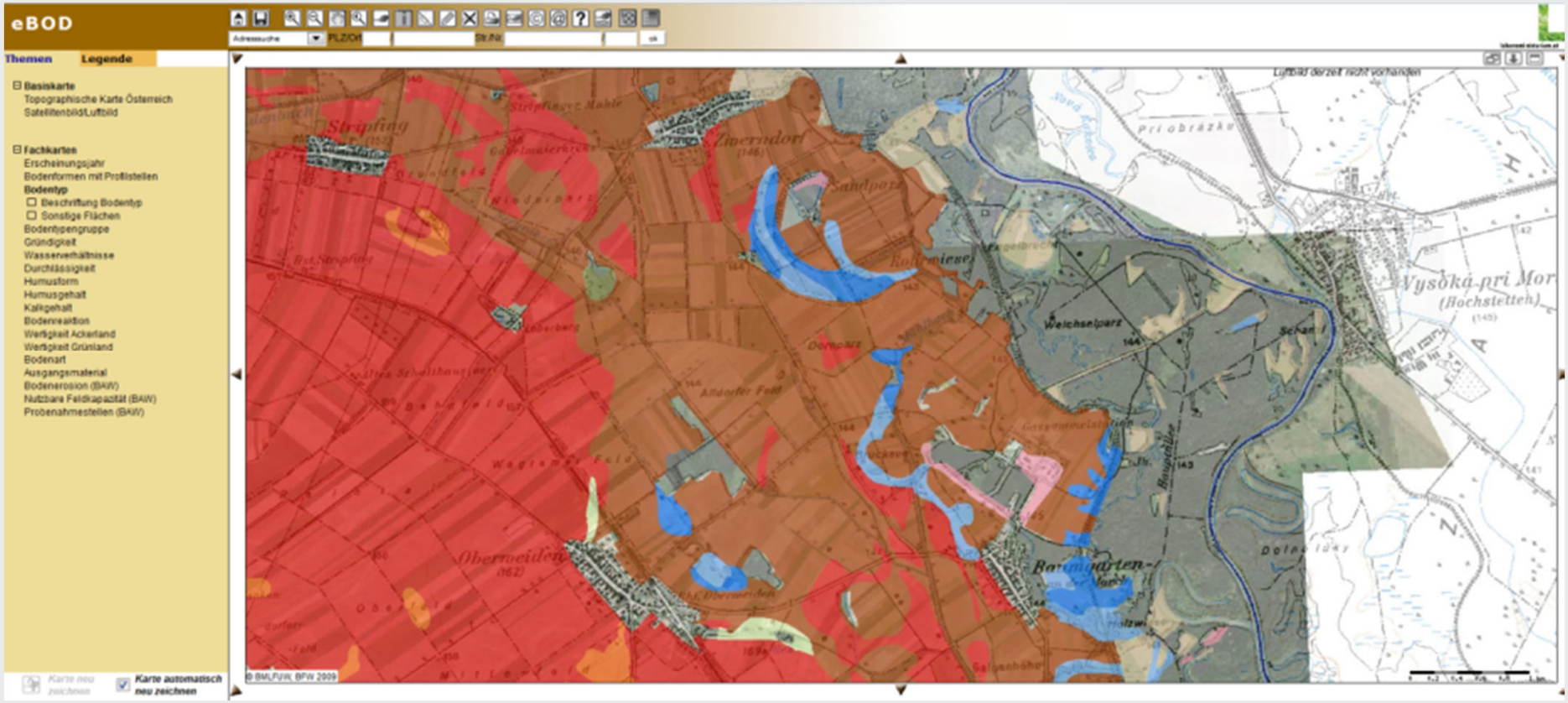

Screenshot from the Austrian soil map eBOD (http://gis.lebensministerium.at/ebod) showing the area of Oberweiden

Soil sampling

The soil types specified in the Austrian soil map eBOD were verified by sampling

Meinhard Breiling

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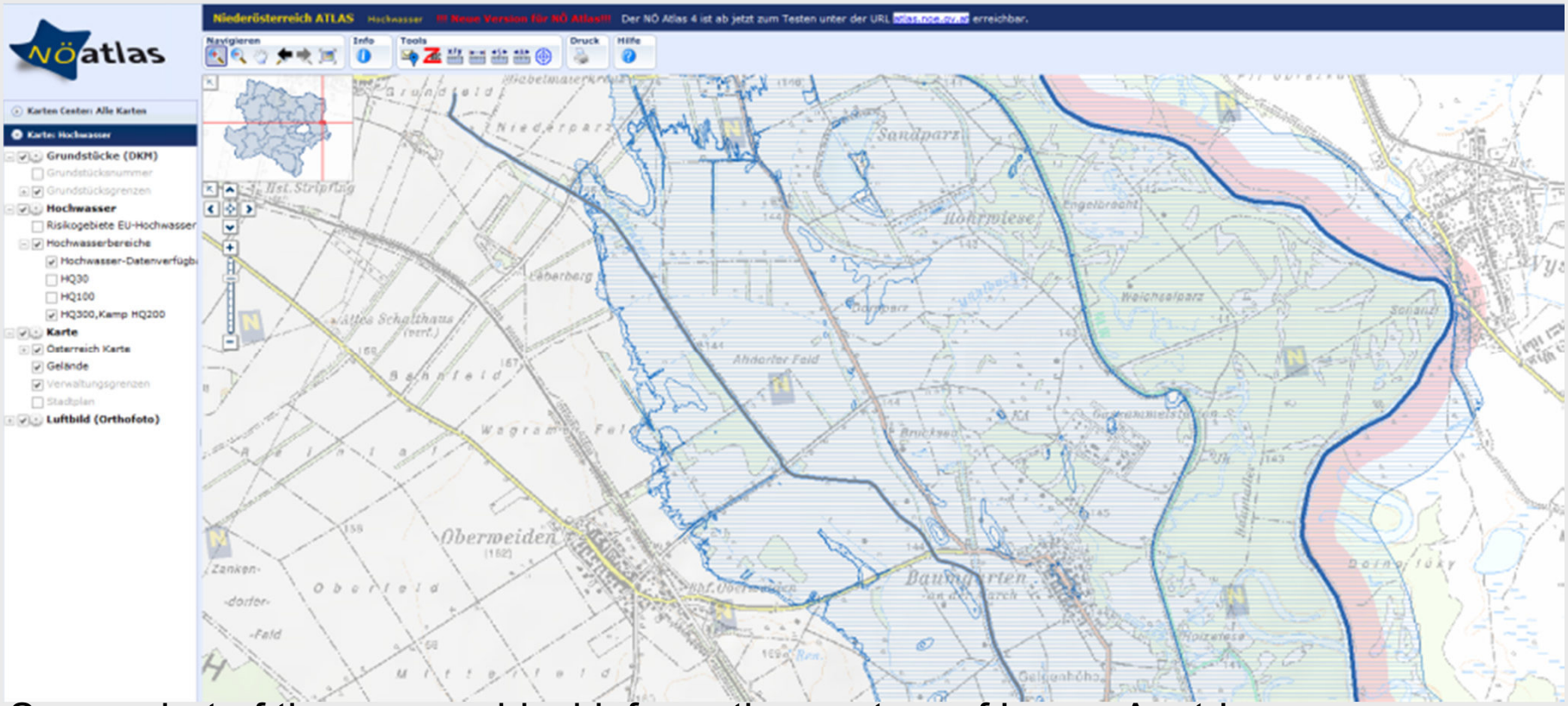
River Morava hydrology



Screenshot of the geographical information system of Lower Austria (NÖ ATLAS - http://atlas.noe.gv.at).

Hatched blue is the runoff area with an return period of 300 years.

The representation is obtained by zooming in and selecting the following map (layer): “floods → flood areas → HQ300”

River Morava hydrology and soil types

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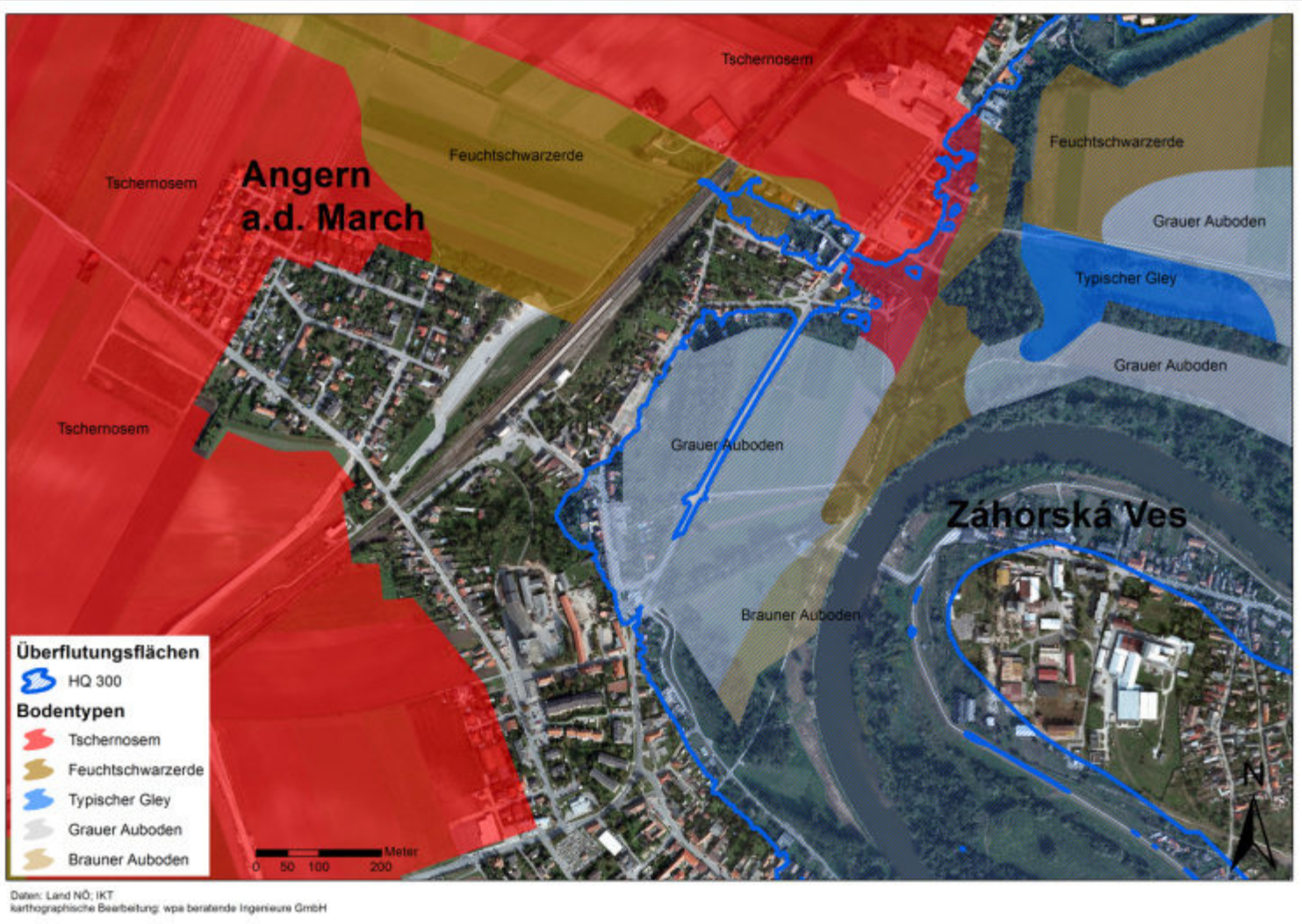
Flooded areas in a 300-year flood (HQ 300) in Angern a.d. March and soil types according to the Austrian soil map -eBOD 1:25.000



River Morava
hydrology and soil types

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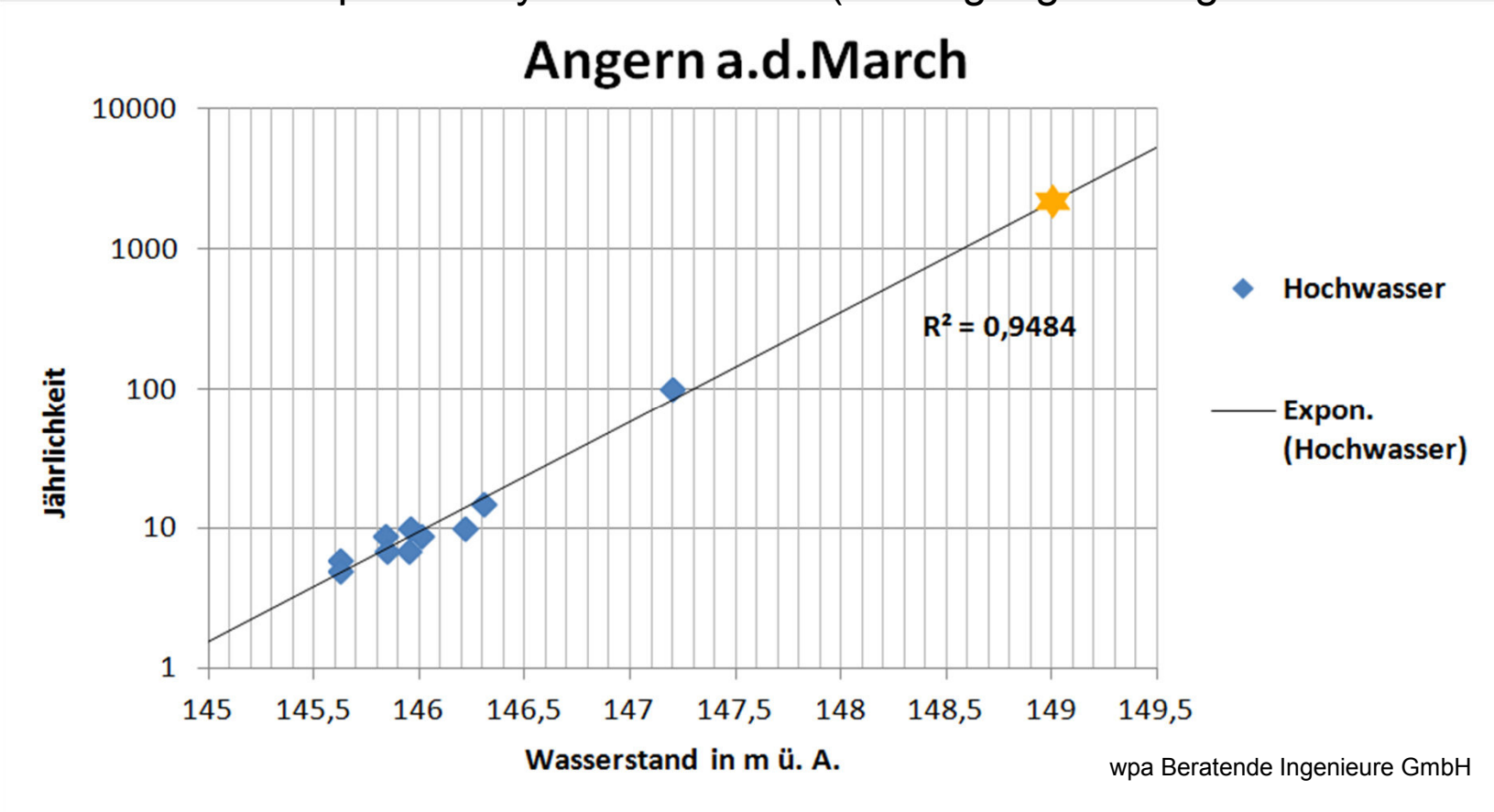
Aerial view of the 2006 flooding of the Morava in which the soil types were transferred from the Austrian soil map 1:25.000

River Morava hydrology

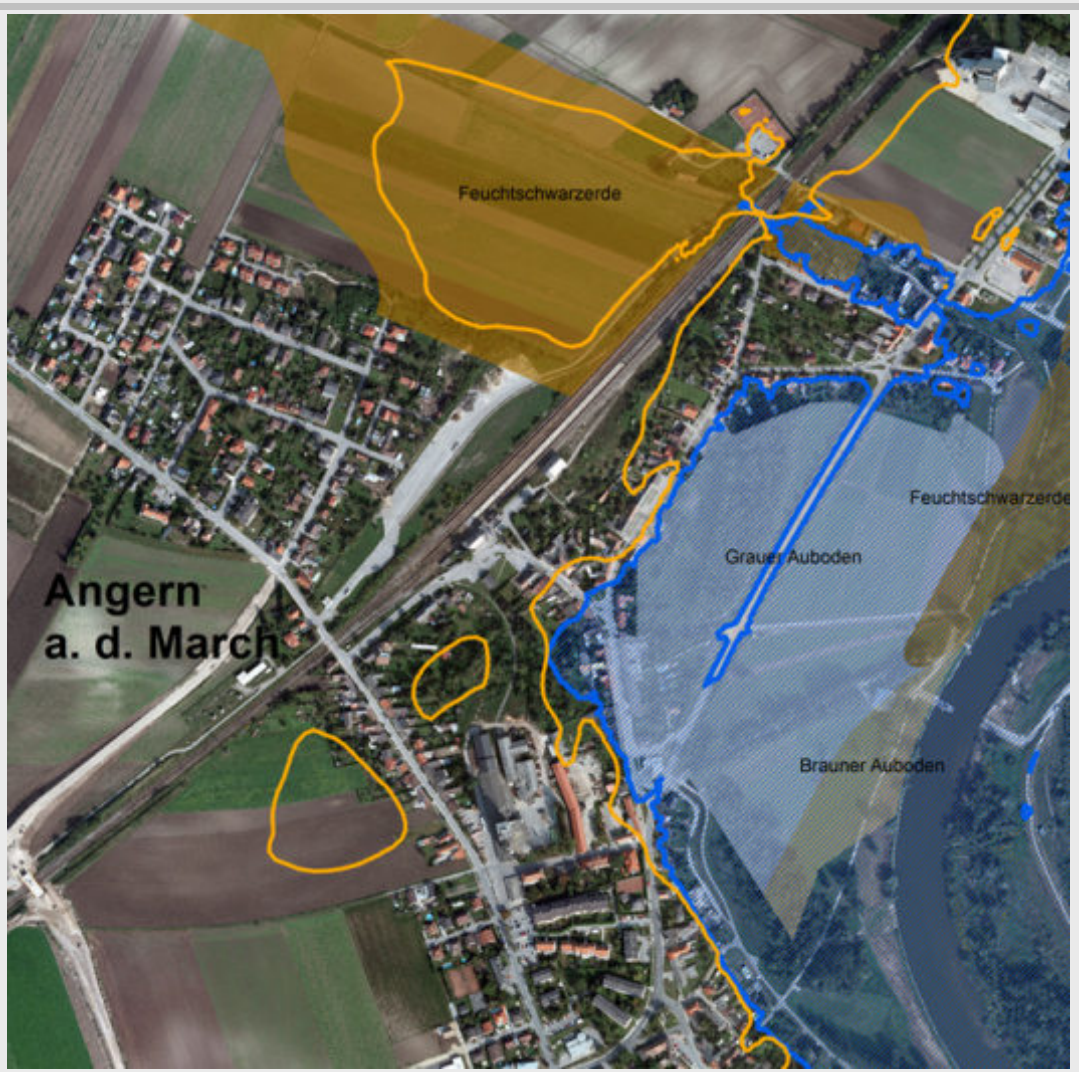
Water levels and probability of occurrence (water gauge in Angern an der March)



Extreme flood events with water levels of 149 m a.s.l. have a return period of more than 1000 years.

Floodplains and soils

Floodplains of floods statistically occurring every 300 years (HQ 300) and of floods with a probability of occurrence beyond 1000 years
(149 m a.s.l.) as well as river water or groundwater-influenced soils in Angern an der March.



Überflutungsflächen **Höhenlinie**

HQ 300 — 149,0 m ü.A.

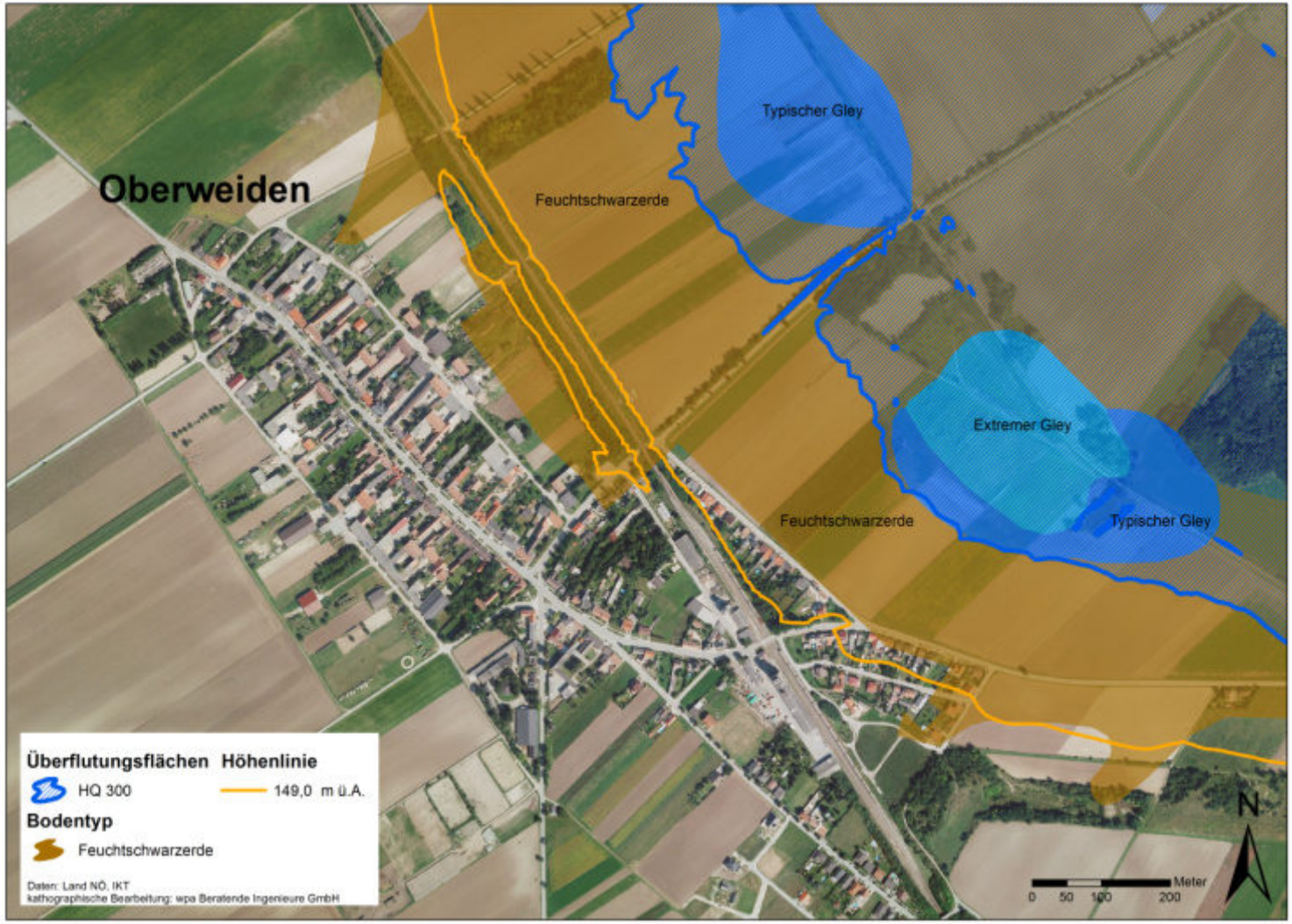
Bodentyp

Feuchtschwarzerde

Daten: Land NÖ, IKT
kathographische Bearbeitung: wpa Beratende Ingenieure GmbH

Floodplains and soils

Floodplains of floods statistically occurring every 300 years (HQ 300) and of floods with a probability of occurrence beyond 1000 years (149 m a.s.l.) as well as river water or groundwater-influenced soils in Oberweiden.



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Summary

From the Austrian soil map we can learn that:

- Auböden (Fluvisoil), Gleye (Gleyesoil) and Feuchtschwarzerden (Gleyic Phaeozem) are soils flooded during high river water levels.
- These soil types can help therefore to identify areas flooded during very seldom flood events.

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Outlook

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Outlook

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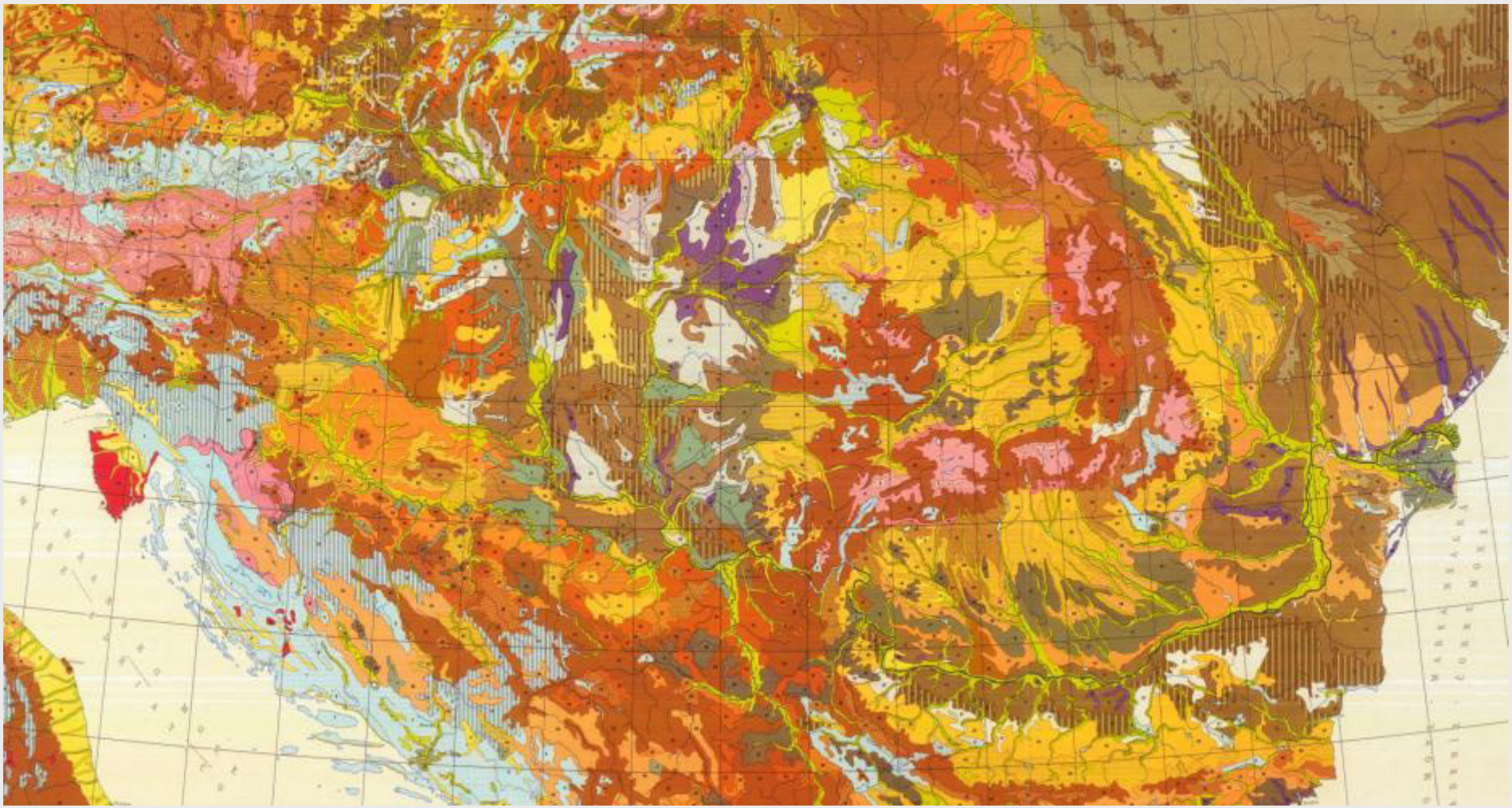

Atlas der Donauländer – Österreichisches Ost- und Südosteuropa Institut, Wien 1984

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Thank you for your attention

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